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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
DRODGE, JOSEPH W

ART UNIT	PAPER NUMBER
1723	

DATE MAILED: 09/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/018,923	KNAPPE ET AL.	
	Examiner	Art Unit	
	Joseph W. Drodge	1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12-14,44,45 and 66-83* is/are pending in the application.

4a) Of the above claim(s) *12-14,44 and 74-76* is/are withdrawn from consideration.

5)☒ Claim(s) *66-73* is/are allowed.

6)☒ Claim(s) *45 and 77-83* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *12-14,44 and 74-76* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) **.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *See Continuation Sheet* .

Continuation of Attachment(s) 6). Other: IDS papers filed 03/02 and 03/03.

NON-FINAL REJECTION

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 12-14, 44 and 74-76, drawn to a spiral wound membrane filtration element having filter layer, feed spacer and permeate carrier sheets and method of making such elements, classified in class 210, subclass 321.74.

II. Claims 45, 66-73 and 77-83, drawn to systems for backflushing spiral wound membrane systems, classified in class 210, subclass 321.69.

The inventions are distinct, each from the other because:

Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention II has separate utility such as systems for backwashing membranes of types distinct from spiral wound membranes having filter layer, feed spacer and permeate carrier sheets. See MPEP § 806.05(d).

The inventions listed as Groups I and II do not relate to a single inventive concept because they lack the same or corresponding special technical features for the following reasons: The special technical features of the claims of Group I are drawn to specific adhesive materials bonding the membrane sheets together and to properties of the adhesive material. The special technical features of the claims of Group II are drawn to combinations of a vacuum system connecting with the permeate side of the membrane filter elements together with means to periodically apply pressurized backflush fluid to cause a reverse flow of permeate through the elements.

During a telephone conversation with James Schumann on September 10, 2003 a provisional election was made without traverse to prosecute the invention of Group II, , claims 45, 66-73 and 77-83. Affirmation of this election must be made by applicant in replying to this Office action. Claims 12-14, 44 and 74-76 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Buckley et al patent 5,171,767 in view of Ohtani et al patent 5,690,830.

Buckley et al disclose a system comprising source of feed solution 4, feed pump 3 and associated feed pipes, feed diverter valve 18 or 19, element pressure tube (column 7, line 56 "tube" or line 63 "cartridge", spiral wound membrane element (column 7, line 55) and means for backflushing (column 10, line 27-column 11, line 10).

The claims differs in requiring a source of compressed gas to backflush. Ohtani et al teach such source (column 5, lines 30-38) used in backwashing of spiral wound and other type membranes. It would have been obvious to one of ordinary skill in the art to have added the source of backwash gas taught by Ohtani et al to the Buckley et al system in order to accelerate the washing effect and shorten backwashing times.

Claims 77, 79-81 and 83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohtani et al patent 5,690,830 in view of Kirwan et al patent 4,548,714.

Ohtani et al disclose a method of periodically backwashing spiral wound membrane filter elements including providing a source 1 of feed solution which is pressurized by feed pump 2 to direct fluid in a filtering direction through a spiral wound membrane element, removal of solids from the element with the concentrate (column 4, lines 1-3 and column 6, lines 1-3), accumulation of some permeate in conduit 31 and periodically causing pressurized backflush gas from compressed air [as in claim 83] source 4 to be

introduced through conduits 40 and 42 (see figure 2) to cause a backflushing flow of the accumulated permeate (column 5, lines 30-38).

The claims differ in requiring the spiral wound filter element to be constructed such that permeate flow passes from the outside of the element through the element and into a collection tube. Kirwan et al teach construction of a spiral wound filter elemtn effective to cause such flow, which is well known in the art of manufacturing spiral wound filter elements. It would have been obvious to one of ordinary skill in the art to have constructed the spiral wound filter element(s) of Ohtani et al to have such outside/in flow taught by Kirwan et al, since such construction allows the modules containing the filter elements to be readily cleaned by minimizing dead space for the feed liquid.

Regarding claims 79-81, see column 6, lines 38-39 of Ohtani et al teaching pressures in the claimed ranges.

Claims 78 and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohtani et al in view of Kirwan et al as applied to claim 77 above, and further in view of Buckley et al patent 5,171,767.

Claim 78 differs also in requiring control of flow rates into and out of the filter element by use of permeate and concentrate diverter valves during the backflushing. Buckley et al teach such features in column 10, lines 61-66. It would have been obvious to one of ordinary skill in the art to have provided such valves to control the backflushing fluids in the Ohtani et al method as taught by Buckley et al, to further reduce operator involvement in filter operations and attendant errors.

Claim 82 further differs in requiring addition of cleaning solutions to the backflushing fluids. Buckley et al also teach such cleaning solution addition in column 11, lines 13-30. It would have been obvious to one of ordinary skill in the art to have incorporated the cleaning solution addition taught by Buckley et al into the Ohtani et al backflushing operations, so as to dissolve adsorbed contaminants.

ALLOWABLE SUBJECT MATTER

Claims 66-70 and also claims 71-73 distinguish over all of the prior art, by respective recitations of systems incorporating spiral wound filter membrane elements which are vertically aligned and installed within tanks, the combination of a vacuum system in communication with the permeate side of the membrane element and means to periodically backflush by applying pressurized backflush fluids (claims 66-70) or providing bubbles below the open lower end of the element which rise upwards through the element to promote turbulence (claims 71-73).

Slegers patent 4,980,066 is the closest prior art with respect to each of the groups of claims in providing such vertically aligned and immersed spiral wound filter membranes within tanks together with means to backflush such membranes. However, Slegers teaches away (column 10, lines 53-58, etc.) from application of a pressurized backflush [as in claims 66-70] citing resultant damage to the membranes and provides a construction precluding the application of bubbles below the membrane elements involving providing inlets and outlets causing a vertically downward flow through the membrane elements [as in claims 71-73].

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bray patent 3,417,870 teaches the claimed basic construction of the sheet layers in spiral wound membranes. Pederson et al patent 5,944,997 teaches providing a bubbler beneath an immersed hollow fiber membrane (not spiral wound). Ford et al patent 4,816,160 teaches in the figure 5 embodiment a backflush system including means to apply a flow of pressurized gas to cause permeate accumulated in a discrete accumualator container to flow in reverse through a membrane element to clean it. Breslau et al generally teaches a variety of methods of backwashing membranes, including the spiral wound types.

Any inquiry concerning this communication or other matters regarding prosecution of this application should be directed to examiner Joseph Drodge at telephone number (703) 308-0403 Monday through Friday between 8:30 AM and 4:45 PM. The Fax number for the examining group is (703) 872-9306.

JWD

September 12, 2003

JOSEPH DRODGE
PRIMARY EXAMINER